Pluggable Optical Modules: Transceivers for the Cisco ONS Family

What You Will Learn

This document provides technical descriptions, applications, and compatibility information for the following categories of optics modules in the Cisco® ONS product family:

- Gigabit interface converter (GBIC)
- Small Form-Factor Pluggable (SFP)
- 10-Gigabit Small Form-Factor Pluggable (XFP)

Introduction

Cisco offers a comprehensive range of pluggable optical modules for the Cisco ONS family of multiservice platforms. The wide variety of modules gives you flexible and cost-effective options for all types of client interfaces. Cisco offers a range of GBICs for Gigabit Ethernet use, a wide variety of SFP modules, and has recently introduced XFP modules. These small, modular optical interface transceivers offer a convenient and cost-effective solution for an array of applications in the data center, campus, metropolitan-area access and ring network, storage area network, and long-haul network.

Technical Overview

SFP Module

An SFP transceiver module (Figure 1) is a bidirectional device with a transmitter and receiver in the same physical package. The module interfaces to the network through a connector interface on the electrical ports and through an LC termination connector on the optical ports. Electrical interfaces and dimensions are defined in the SFF-8472 industry-standard multisource agreement (MSA).

Figure 1. SFP Transceiver Modules for the Cisco ONS Family

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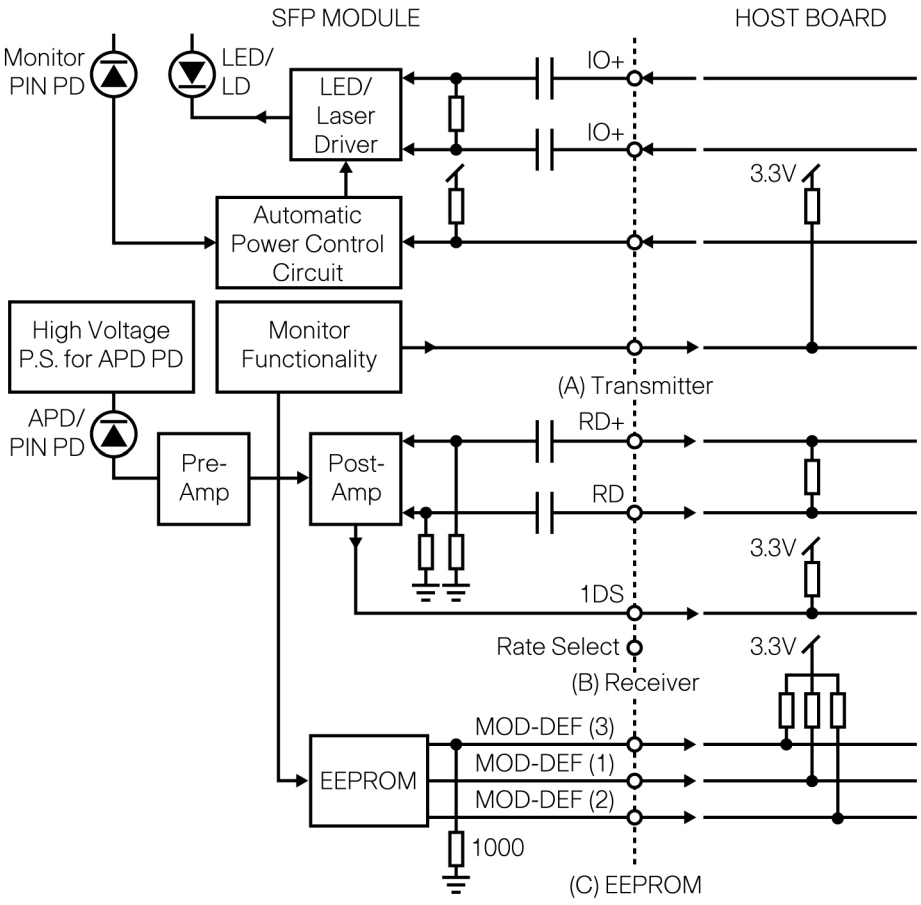
Figure 2 provides a schematic of the SFP transceiver module functional block diagram. The diagram shows the transmitter, receiver, and electrically erasable programmable read-only memory (EEPROM) storage chip. This block diagram is intended for informational purposes only and does not illustrate design requirements.

- **Transmitter:** In the transmit direction, the SFP transceiver module receives the electrical signal and transmits this data in an optical signal by using a laser driver that controls the laser diode. The optical output power is held constant by an automatic power control circuit.
- **Receiver:** In the receive direction, the SFP transceiver module receives an NRZ optical signal and converts it to an electrical equivalent. The receive portion of the module uses an amplifier to control the converted electrical signal.
- **EEPROM:** This type of SFP transceiver is identified by the standard two-wire serial interface used in EEPROM with an I2C interface (with serial ID functions) that is part of the GBIC specifications and the SFF-8472 MSA. In addition, EEPROM offers an enhanced monitoring interface for optical transceivers as described in SFF-8472, which allows real-time access to the device to allow monitoring of the physical parameter such as received optical power, laser bias current, and laser optical output power.

Figure 2. SFP Module Block Diagram



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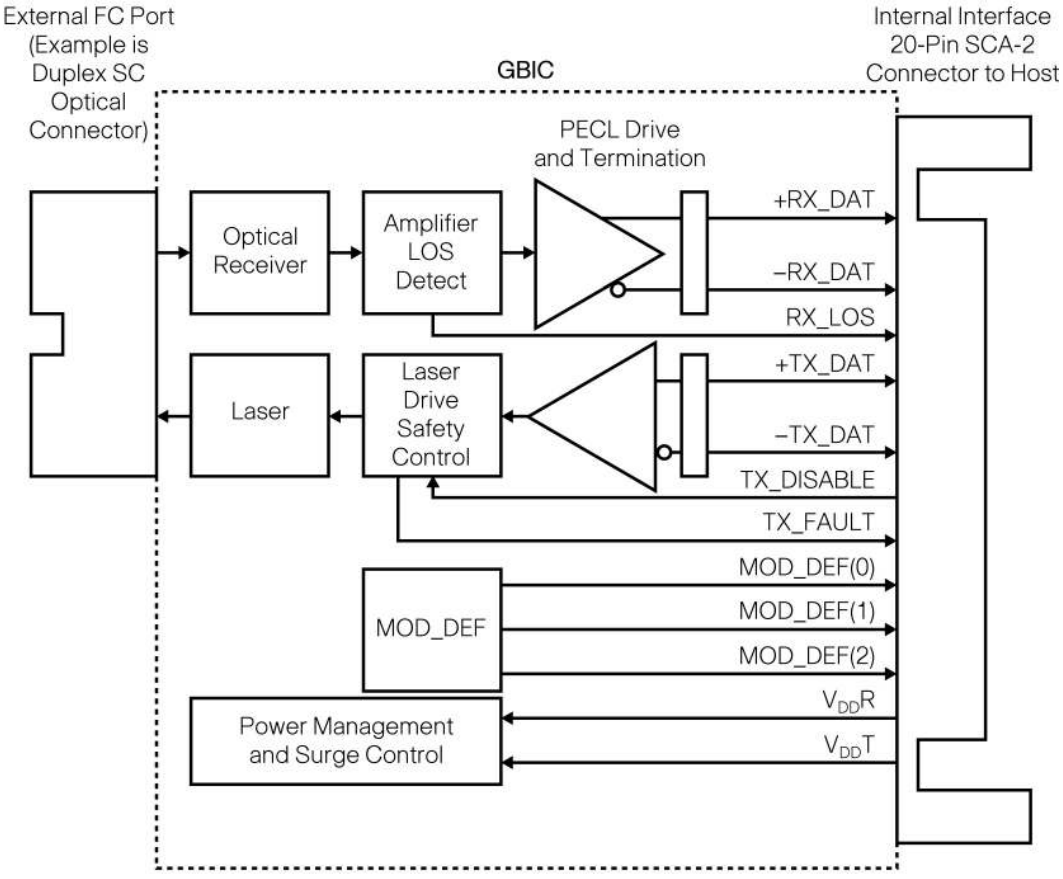
GBIC Module

The GBIC transceiver module (Figures 3 and 4) is a bidirectional device with a transmitter and receiver in the same physical package. This transceiver converts serial electric signals to serial optical signals and the reverse. In networking, a GBIC transceiver is used to interface a fiber optic system with an Ethernet system, such as Fibre Channel and Gigabit Ethernet.

Figure 3. GBIC Transceiver Modules for the Cisco ONS Family

Figure 4. Functional Diagram of Typical Shortwave Laser GBIC



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XFP Module

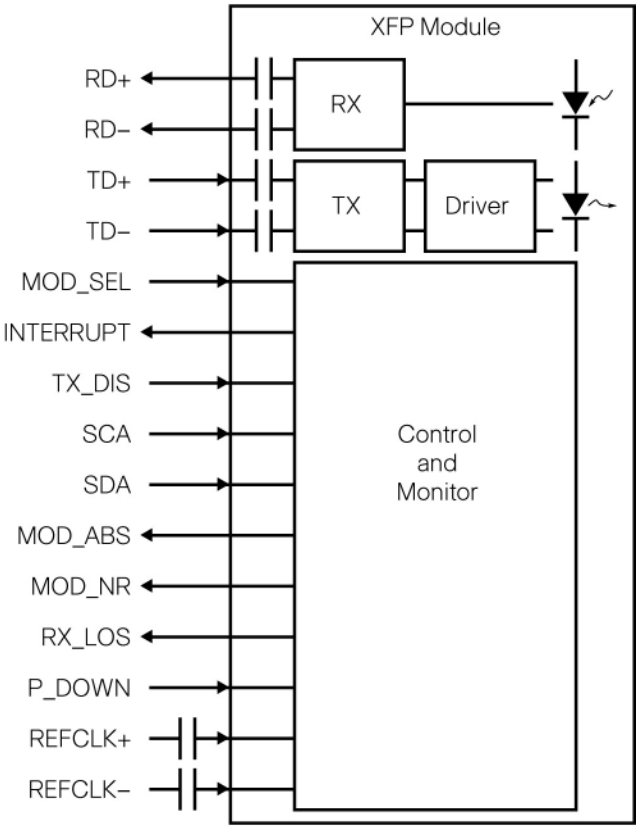
The XFP transceiver module (Figure 5) is a bidirectional device with a transmitter and receiver in the same physical package. The XFP module contains a 30-pin surface mount connector on the electrical interface and a duplex LC connector on the optical interface.

Figure 5. XFP Transceiver Module for the Cisco ONS Family

Figure 6 shows an XFP transceiver module functional block diagram. It contains a transmitter and receiver.

- **Transmitter:** In the transmit direction, the transceiver module receives a 10-Gbps electrical data signal and transmits the data as an optical signal through an electrical to optical (E/O) converter. The optical output power is held constant by an automatic power control circuit. The transmitter also contains a clock data recovery circuit. The function of this circuit is to attenuate and reshape any jitter received on the electrical interface.
- **Receiver:** In the receive direction, the transceiver module receives a 10-Gbps optical signal and converts it to an electrical equivalent. The receiver contains a clock data recovery circuit.

Figure 6. XFP Module Block Diagram



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Pluggable Modules: List and Description

Cisco ONS Family modules have well-defined product IDs, making it easy for you to order the appropriate module.

The product ID is structured as follows: ONS-AB-CCC-DD. The variables in the ID include:

- **A:** S for SFP, G for GBIC, and X for XFP
- **B:** C for commercial temperature (0 to 70℃), E for extended temperature (–10 to 85℃), and I for industrial temperature (–40 to 85℃)
- **CCC:** Supported bit-rate or signal type; 155 Mbps for OC-12/STM-1 signal or 2 GF for a tri-rate Gigabit Ethernet, Fibre Channel, and 2G Fibre Channel signal support
- **DD:** Supported reach; S1 for short-reach or intraoffice 1310 nm interface or SX for Ethernet

There are still some older product IDs for the Cisco ONS 15454 platform, but those IDs will migrate to the current ID scheme for the Cisco ONS family.

SONET/SDH SFP Modules

Cisco offers a wide range of SFP modules that are fully compliant with SONET and SDH standards. Table 1 provides details.

Table 1. SONET/SDH SFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
ONS-SE-2G-S1=	SFP – OC48/STM16 – 1310 nm, SR – SM LC	10-2017-01	GR253 OC48 SR G.957 I-16	–10 to +85
ONS-SE-2G-L2=	OC48/STM16, LR2, 1550 nm, SFP, EXT	10-2013-01	GR253 OC48 LR2 G.957 L-16.2	–10 to +85
ONS-SI-155-SR-MM=	SFP – OC3, SR, 1310 nm, MULTI MODE, I-TEMP	10-2279-01	GR253	–40 to +85
ONS-SI-155-I1=	SFP – OC3/STM1 IR1/S-1.1 1310 nm, ITEMP	10-1938-02	GR253 OC3 IR1 G.957 S-1.1	–40 to +85
ONS-SI-155-L1=	SFP – OC3/STM1 LR, L-1.1, 1310 nm, ITEMP	10-1957-02	GR253 OC3 LR1 G.957 L-1.1	–40 to +85
ONS-SI-155-L2=	SFP – OC3/STM1 LR-2, L-1.2, 1550 nm, ITEMP	10-1937-02	GR253 OC3 LR2 G.957 L-1.2	–40 to +85
ONS-SI-622-SR-MM=	SFP – OC12, SR, 1310 NM, MULTI MODE, I-TEMP	10-2280-01	GR253	–40 to +85
ONS-SI-622-I1=	SFP – OC12/STM4 and OC3/STM1 IR, S-4.1, S-1.1, 1310 nm, ITEMP	10-1956-02	GR253 OC3/OC12 IR1 G.957 S-4.1/S-1.1	–40 to +85
ONS-SI-622-L1=	SFP – OC12/STM4 LR, L-4.1, 1310 nm, ITEMP	10-1958-02	GR253 OC12 LR1 G.957 L-4.1	–40 to +85
ONS-SI-622-L2=	SFP – OC12/STM4 LR, L-4.2, 1550 nm, ITEMP	10-1936-02	GR253 OC12 LR2 G.957 L-4.2	–40 to +85
ONS-SI-2G-S1	SFP – OC48/STM16, SR, 1310 nm, ITEMP, LC	10-1992-02	GR253 OC48 SR G.957 I-16	–40 to +85
ONS-SI-2G-I1=	SFP – OC48/STM16, IR, 1310 nm, ITEMP, LC	10-1993-02	GR253 OC48 IR1 G.957 S-16.1	–40 to +85
ONS-SI-2G-L1=	SFP – OC48/STM16, LR1, 1310 nm, ITEMP, LC	10-2102-02	GR253 OC48 LR1 G.957 L-16.1	–40 to +85
ONS-SI-2G-L2=	SFP – OC48/STM16, LR2, 1550 nm, ITEMP, LC	10-1990-02	GR253 OC48 LR2 G.957 L-16.2	–40 to +85

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Data SFP Modules

Cisco offers a wide range of data SFP modules capable of transmitting Gigabit Ethernet, Fibre Channel, IBM Fiber Connection (FICON), and Enterprise Systems Connection (ESCON) signal format. Table 2 provides details.

Table 2. Data SFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
ONS-SE-100-LX10=	SFP – 100 Mbps Long Reach – 1310 nm – SM – LC, EXT-TEMP	10-2213-01	100BASE LX IEEE-802.3	–10 to +85
ONS-SI-100-LX10=	SFP – 100 Mbps Long Reach – 1310 nm – SM – LC, I-TEMP	10-2294-01	100BASE LX IEEE-802.3	–40 to +85
ONS-SE-100-FX=	SFP – 100 Mbps Short Reach – 1310 nm – MM – LC, EXT-TEMP	10-2212-01	100BASE FX IEEE-802.3	–10 to +85
ONS-SI-100-FX=	SFP – 100 Mbps Short Reach – 1310 nm – MM – LC, I-TEMP	10-2350-01	100BASE FX IEEE-802.3	–40 to +85
ONS-SE-100-BX10U=	SFP – 10/100 BX-U, EXT	10-2353-01	100BASE BX-U IEEE-802.3	–10 to +85
ONS-SE-100-BX10D=	SFP – 10/100 BX-D, EXT	10-2352-01	1000BASE BX-D IEEE-802.3	–10 to +85
ONS-SE-GE-BXU=	SFP – 1000BASE-BX U – GE Bidirectional Upstream – Ext Temp		100BASE BX-U IEEE-802.3	–10 to +85
ONS-SE-GE-BXD=	SFP – 1000BASE BX D – GE Bidirectional Downstream Ext Temp		1000BASE BX-D IEEE-802.3	–10 to +85
15327-SFP-LC-SX= EOS	1000BASE-SX LC, SFP	30-1301-01	1000BASE SX IEEE-802.3	0 to +70
15327-SFP-LC-LX= EOS	1000BASE-LX LC, SFP	30-1299-01	1000BASE SX IEEE-802.3	0 to +70
15454-SFP-LC-SX=	1000BASE-ASESX LC, SFP	30-1301-01	1000BASE SX IEEE-802.3	0 to +70
15454-SFP-LC-LX=	1000BASE LX LC, SFP	30-1299-01	1000BASE LX IEEE-802.3	0 to +70
ONS-SC-GE-SX=1	1000BASE SX SFP – 850 nm – LC – C Temp	10-2301-01	1000BASE SX IEEE-802.3	0 to +70
ONS-SI-GE-SX=	SFP – 1000BASE-SX Gigabit Ethernet, 850 nm, MM, I-TEMP	10-2295-01	1000BASE SX IEEE-802.3	–40 to +85
ONS-SC-GE-LX=[2]	1000BASE LX SFP – 1310 nm – LC – C Temp	10-2298-01	1000BASE LX IEEE-802.3	0 to +70
ONS-SI-GE-LX=	SFP – 1000BASE-LX Gigabit Ethernet, 1310 nm, SM, I-TEMP	10-2300-01	1000BASE SX IEEE-802.3	–40 to +85
15454-SFP-GE+-LX= EOS	SFP – GE/1G-FC/2G-FC – 1310 nm – MM – LC	10-1832-03	1000BASE LX IEEE-802.3, 100-M5-SN-I 200-M5-SN-I	–10 to +85
15454-SFP-GEFC-SX= EOS	SFP – GE/1G-FC/2G-FC – 850 nm – MM – LC	10-1833-02	1000BASE SX IEEE-802.3, 100-M5-SN-I 100-M6-SN-I 200-M5-SN-I 200-M6-SN-I	–10 to +85
ONS-SE-G2F-SX=	SFP – GE/1G-FC/2G-FC – 850 nm – MM – LC – EXT TEMP	10-2272-02	1000BASE SX IEEE-802.3, 100-M5-SN-I 100-M6-SN-I 200-M5-SN-I 200-M6-SN-I	–10 to +85
ONS-SE-G2F-LX=	SFP – GE/1G-FC/2G-FC/HDTV – 1310 nm – SM – LC – EXT TEMP	10-2273-02	1000BASE LX IEEE-802.3, 100-SM-LC-L 200-SM-LC-L	–10 to +85
ONS-SI-GE-ZX=	SFP – 1000BASE-ZX Gigabit Ethernet, 1550 nm, SM, I-Temp	10-2296-01	1000BASE ZX IEEE-802.3	–40 to +85

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Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
ONS-SE-GE-ZX=	SFP – 1000BASE-ZX Gigabit Ethernet, 1550, SM, Ext-Temp	10-2354-01	1000BASE ZX IEEE-802.3	–10 to +85
15454-SFP-200=	SFP-ESCON – 1310 nm – MM – LC	10-1750-01	ESCON	0 to +70
ONS-SE-200-MM=	SFP-ESCON – 1310 nm – MM – LC – EXT TEMP	10-2248-01	ESCON	–10 to +85
ONS-SE-4G-MM=	4G FC SFP, 850 nm, LC, MM – EXT TEMP	10-2259-01	400-M5-SN-I and 400-M6-SN-I	–10 to +85
ONS-SE-4G-SM=	4G FC SFP, 1310 nm, LC, SM – EXT TEMP	10-2252-01	400-SM-LC-L	–10 to +85

1 This SFP module will replace the 15327-SFP-LC-SX= and 15454-SFP-LC-SX=, which have begun the end-of-life process.

2 This SFP module will replace the 15327-SFP-LC-LX= and 15454-SFP-LC-LX=, which have begun the end-of-life process.

Electrical SFP Modules

Cisco offers electrical SFP modules for the Cisco ONS Series platform. Table 3 shows the details.

Table 3. Electrical SFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
ONS-SE-ZE-EL=	SFP – 10/100/1000 Ethernet BASE-T Multirate Copper RJ-45	10-2351-01	IEEE-802.3	–10 to +85
ONS-SC-155-EL=	SFP – STM1 Electrical	10-2363-01	ITU-T G.703 (ES1)	0 to +70
ONS-SC-E3-T3-PW=	SFP – E3/DS3 PDH over FE Pseudowire – Commercial Temp	30-1450-01	ITU-T G.703	0 to +70
ONS-SC-E1-T1-PW=	SFP – E1/DS1 PDH over FE Pseudowire – Commercial Temp	30-1447-01	ITU-T G.703	0 to +70
ONS-SC-EoP1=	SFP – FE over DS1/E1 – Commercial Temp	30-1446-01	ITU-T G.703	0 to +70
ONS-SC-EOP3=	SFP – FE over DS3/E3 – Commercial Temp	30-1449-01	ITU-T G.703	0 to +70

Multirate SFP Module

Cisco offers a multirate SFP module for the Cisco ONS 15600 and 15454 platforms. Table 4 provides details.

Table 4. Multirate SFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
ONS-SE-Z1=	SFP-OC-48IR1,12/3SR1, GE LX STM S-16.1, I-4, I-1, 1310nm EXT-TEMP	10-1971-02	1000BASE-LX IEEE-802.3, GR253 OC-48 IR1 OC-12 SR, OC-3 SR G.957 S-16.1, I-4.1, I-1.1	–10 to +85

Optical Service Channel SFP Module

Cisco offers an Optical Service Channel SFP module for the Cisco ONS 15454 MSTP. Table 5 provides details.

Table 5. Multirate SFP Module

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
ONS-SC-OSC-ULH=	SFP-OC-3/STM-1/FE Optical Service Channel SFPs ULH-Commercial Temp	10-2469-01	FE IEEE-802.3, GR253 OC3 G.957 STM-1	–10 to +85

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DWDM SFP Modules

Cisco offers a wide range of dense-wavelength-division multiplexing (DWDM) ITU-T compliant SFP modules. Table 6 lists details.

Table 6. DWDM SFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
ONS-SC-2G-28.7=	OC-48/STM-16, SFP, 1528.77, 100 GHz, LC	10-2307-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-30.3=	OC-48/STM-16, SFP, 1530.33, 100 GHz, LC	10-2155-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-31.1=	OC-48/STM-16, SFP, 1531.12, 100 GHz, LC	10-2156-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-31.9=	OC-48/STM-16, SFP, 1531.90, 100 GHz, LC	10-2157-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-32.6=	OC-48/STM-16, SFP, 1532.68, 100 GHz, LC	10-2158-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-33.4=	OC-48/STM-16, SFP, 1533.47, 100 GHz, LC	10-2306-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-34.2=	OC-48/STM-16, SFP, 1534.25, 100 GHz, LC	10-2159-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-35.0=	OC-48/STM-16, SFP, 1535.04, 100 GHz, LC	10-2160-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-35.8=	OC-48/STM-16, SFP, 1535.82, 100 GHz, LC	10-2161-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-36.6=	OC-48/STM-16, SFP, 1536.61, 100 GHz, LC	10-2162-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-38.1=	OC-48/STM-16, SFP, 1538.19, 100 GHz, LC	10-2163-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-38.9=	OC-48/STM-16, SFP, 1538.98, 100 GHz, LC	10-2164-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-39.7=	OC-48/STM-16, SFP, 1539.77, 100 GHz, LC	10-2165-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-40.5=	OC-48/STM-16, SFP, 1540.56, 100 GHz, LC	10-2185-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-41.3=	OC-48/STM-16, SFP, 1541.35, 100 GHz, LC	10-2305-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-42.1=	OC-48/STM-16, SFP, 1542.14, 100 GHz, LC	10-2166-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-42.9=	OC-48/STM-16, SFP, 1542.94, 100 GHz, LC	10-2167-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-43.7=	OC-48/STM-16, SFP, 1543.73, 100 GHz, LC	10-2168-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-44.5=	OC-48/STM-16, SFP, 1544.53, 100 GHz, LC	10-2169-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-46.1=	OC-48/STM-16, SFP, 1546.12, 100 GHz, LC	10-2170-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-46.9=	OC-48/STM-16, SFP, 1546.92, 100 GHz, LC	10-2171-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-47.7=	OC-48/STM-16, SFP, 1547.72, 100 GHz, LC	10-2172-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-48.5=	OC-48/STM-16, SFP, 1548.51, 100 GHz, LC	10-2173-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-49.3=	OC-48/STM-16, SFP, 1549.32, 100 GHz, LC	10-2304-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-50.1=	OC-48/STM-16, SFP, 1550.12, 100 GHz, LC	10-2186-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-50.9=	OC-48/STM-16, SFP, 1550.92, 100 GHz, LC	10-2174-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-51.7=	OC-48/STM-16, SFP, 1551.72, 100 GHz, LC	10-2175-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-52.5=	OC-48/STM-16, SFP, 1552.52, 100 GHz, LC	10-2176-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-54.1=	OC-48/STM-16, SFP, 1554.13, 100 GHz, LC	10-2177-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-54.9=	OC-48/STM-16, SFP, 1554.94, 100 GHz, LC	10-2178-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-55.7=	OC-48/STM-16, SFP, 1555.75, 100 GHz, LC	10-2179-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-56.5=	OC-48/STM-16, SFP, 1556.55, 100 GHz, LC	10-2180-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-57.3=	OC-48/STM-16, SFP, 1557.36, 100 GHz, LC	10-2308-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-58.1=	OC-48/STM-16, SFP, 1558.17, 100 GHz, LC	10-2181-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-58.9=	OC-48/STM-16, SFP, 1558.98, 100 GHz, LC	10-2182-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-59.7=	OC-48/STM-16, SFP, 1559.79, 100 GHz, LC	10-2183-02	ITU G694, GR2918	0 to +70
ONS-SC-2G-60.6=	OC-48/STM-16, SFP, 1560.61, 100 GHz, LC	10-2184-02	ITU G694, GR2918	0 to +70
ONS-SC-4G-30.3=	SFP - 4G FC 1530.33, 100 GHz, LC - Commercial Temp	10-2487-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-31.1=	SFP - 4G FC 1531.12, 100 GHz, LC - Commercial Temp	10-2488-01	ITU G694, GR2918	0 to +70

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Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
ONS-SC-4G-31.9=	SFP - 4G FC 1531.90, 100 GHz, LC - Commercial Temp	10-2489-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-32.6=	SFP - 4G FC 1532.68, 100 GHz, LC - Commercial Temp	10-2490-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-33.4=	SFP - 4G FC 1533.47, 100 GHz, LC - Commercial Temp	10-2491-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-34.2=	SFP - 4G FC 1534.25, 100 GHz, LC - Commercial Temp	10-2523-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-35.0=	SFP - 4G FC 1535.04, 100 GHz, LC - Commercial Temp	10-2492-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-35.8=	SFP - 4G FC 1535.82, 100 GHz, LC - Commercial Temp	10-2493-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-36.6=	SFP - 4G FC 1536.61, 100 GHz, LC - Commercial Temp	10-2494-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-37.4=	SFP - 4G FC 1537.40, 100 GHz, LC - Commercial Temp	10-2495-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-38.1=	SFP - 4G FC 1538.19, 100 GHz, LC - Commercial Temp	10-2496-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-38.9=	SFP - 4G FC 1538.98, 100 GHz, LC - Commercial Temp	10-2497-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-39.7=	SFP - 4G FC 1539.77, 100 GHz, LC - Commercial Temp	10-2502-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-40.5=	SFP - 4G FC 1540.56, 100 GHz, LC - Commercial Temp	10-2503-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-41.3=	SFP - 4G FC 1541.35, 100 GHz, LC - Commercial Temp	10-2498-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-42.1=	SFP - 4G FC 1542.14, 100 GHz, LC - Commercial Temp	10-2499-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-42.9=	SFP - 4G FC 1542.94, 100 GHz, LC - Commercial Temp	10-2500-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-43.7=	SFP - 4G FC 1543.73, 100 GHz, LC - Commercial Temp	10-2501-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-44.5=	SFP - 4G FC 1544.53, 100 GHz, LC - Commercial Temp	10-2521-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-45.3=	SFP - 4G FC 1545.32, 100 GHz, LC - Commercial Temp	10-2527-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-46.1=	SFP - 4G FC 1546.12, 100 GHz, LC - Commercial Temp	10-2520-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-46.9=	SFP - 4G FC 1546.92, 100 GHz, LC - Commercial Temp	10-2519-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-47.7=	SFP - 4G FC 1547.72, 100 GHz, LC - Commercial Temp	10-2518-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-48.5=	SFP - 4G FC 1548.51, 100 GHz, LC - Commercial Temp	10-2517-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-49.3=	SFP - 4G FC 1549.32, 100 GHz, LC - Commercial Temp	10-2516-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-50.1=	SFP - 4G FC 1550.12, 100 GHz, LC - Commercial Temp	10-2515-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-50.9=	SFP - 4G FC 1550.92, 100 GHz, LC - Commercial Temp	10-2514-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-51.7=	SFP - 4G FC 1551.72, 100 GHz, LC - Commercial Temp	10-2526-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-52.5=	SFP - 4G FC 1552.52, 100 GHz, LC - Commercial Temp	10-2513-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-53.3=	SFP - 4G FC 1553.33, 100 GHz, LC - Commercial Temp	10-2512-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-54.1=	SFP - 4G FC 1554.13, 100 GHz, LC - Commercial Temp	10-2525-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-54.9=	SFP - 4G FC 1554.94, 100 GHz, LC - Commercial Temp	10-2511-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-55.7=	SFP - 4G FC 1555.75, 100 GHz, LC - Commercial Temp	10-2510-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-56.5=	SFP - 4G FC 1556.55, 100 GHz, LC - Commercial Temp	10-2509-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-57.3=	SFP - 4G FC 1557.36, 100 GHz, LC - Commercial Temp	10-2524-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-58.1=	SFP - 4G FC 1558.17, 100 GHz, LC - Commercial Temp	10-2508-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-58.9=	SFP - 4G FC 1558.98, 100 GHz, LC - Commercial Temp	10-2507-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-59.7=	SFP - 4G FC 1559.79, 100 GHz, LC - Commercial Temp	10-2506-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-60.6=	SFP - 4G FC 1560.61, 100 GHz, LC - Commercial Temp	10-2505-01	ITU G694, GR2918	0 to +70
ONS-SC-4G-61.4=	SFP - 4G FC 1561.43, 100 GHz, LC - Commercial Temp	10-2504-01	ITU G694, GR2918	0 to +70

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CWDM SFP Modules

Cisco offers a wide range of coarse wavelength-division multiplexing (CWDM) ITU-T compliant SFP modules. Table 7 lists the details.

Table 7. CWDM SFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
ONS-SE-155-1470=	SFP – OC-3/STM-1, CWDM, 1470 nm, EXT	10-1996-01	ITU-T G.694.2	–10 to +85
ONS-SE-155-1490=	SFP – OC-3/STM-1, CWDM, 1490 nm, EXT	10-1998-01	ITU-T G.694.2	–10 to +85
ONS-SE-155-1510=	SFP – OC-3/STM-1, CWDM, 1510 nm, EXT	10-1999-01	ITU-T G.694.2 IEEE 802.3 FE	–10 to +85
ONS-SE-155-1530=	SFP – OC-3/STM-1, CWDM, 1530 nm, EXT	10-2000-01	ITU-T G.694.2	–10 to +85
ONS-SE-155-1550=	SFP – OC-3/STM-1, CWDM, 1550 nm, EXT	10-2001-01	ITU-T G.694.2	–10 to +85
ONS-SE-155-1570=	SFP – OC-3/STM-1, CWDM, 1570 nm, EXT	10-2002-01	ITU-T G.694.2	–10 to +85
ONS-SE-155-1590=	SFP – OC-3/STM-1, CWDM, 1590 nm, EXT	10-2003-01	ITU-T G.694.2	–10 to +85
ONS-SE-155-1610=	SFP – OC-3/STM-1, CWDM, 1610 nm, EXT	10-1997-01	ITU-T G.694.2	–10 to +85
ONS-SE-622-1470=	SFP – OC-12/STM-4, CWDM, 1470 nm, EXT	10-2004-01	ITU-T G.694.2	–10 to +85
ONS-SE-622-1490=	SFP – OC-12/STM-4, CWDM, 1490 nm, EXT	10-2005-01	ITU-T G.694.2	–10 to +85
ONS-SE-622-1510=	SFP – OC-12/STM-4, CWDM, 1510 nm, EXT	10-2006-01	ITU-T G.694.2	–10 to +85
ONS-SE-622-1530=	SFP – OC-12/STM-4, CWDM, 1530 nm, EXT	10-2007-01	ITU-T G.694.2	–10 to +85
ONS-SE-622-1550=	SFP – OC-12/STM-4, CWDM, 1550 nm, EXT	10-2008-01	ITU-T G.694.2	–10 to +85
ONS-SE-622-1570=	SFP – OC-12/STM-4, CWDM, 1570 nm, EXT	10-2009-01	ITU-T G.694.2	–10 to +85
ONS-SE-622-1590=	SFP – OC-12/STM-4, CWDM, 1590 nm, EXT	10-2010-01	ITU-T G.694.2	–10 to +85
ONS-SE-622-1610=	SFP – OC-12/STM-4, CWDM, 1610 nm, EXT	10-2011-01	ITU-T G.694.2	–10 to +85
ONS-SC-Z3-1470=	SFP – OC-48/STM-16/GE, CWDM, 1470 nm	10-2285-01	ITU-T G.694.2	0 to +70
ONS-SC-Z3-1490=	SFP – OC-48/STM-16/GE, CWDM, 1490 nm	10-2286-01	ITU-T G.694.2	0 to +70
ONS-SC-Z3-1510=	SFP – OC-48/STM-16/GE, CWDM, 1510 nm	10-2287-01	ITU-T G.694.2	0 to +70
ONS-SC-Z3-1530=	SFP – OC-48/STM-16/GE, CWDM, 1530 nm	10-2288-01	ITU-T G.694.2	0 to +70
ONS-SC-Z3-1550=	SFP – OC-48/STM-16/GE, CWDM, 1550 nm	10-2289-01	ITU-T G.694.2	0 to +70
ONS-SC-Z3-1570=	SFP – OC-48/STM-16/GE, CWDM, 1570 nm	10-2290-01	ITU-T G.694.2	0 to +70
ONS-SC-Z3-1590=	SFP – OC-48/STM-16/GE, CWDM, 1590 nm	10-2291-01	ITU-T G.694.2	0 to +70
ONS-SC-Z3-1610=	SFP – OC-48/STM-16/GE, CWDM, 1610 nm	10-2292-01	ITU-T G.694.2	0 to +70
ONS-SE-2G-1470=	SFP – OC-48/STM-16/GE, CWDM, 1470 nm Ext Temp	10-2461-01	ITU-T G.694.2	0 to +85
ONS-SE-2G-1490=	SFP – OC-48/STM-16/GE, CWDM, 1490 nm Ext Temp	10-2462-01	ITU-T G.694.2	0 to +85
ONS-SE-2G-1510=	SFP – OC-48/STM-16/GE, CWDM, 1510 nm Ext Temp	10-2463-01	ITU-T G.694.2	0 to +85
ONS-SE-2G-1530=	SFP – OC-48/STM-16/GE, CWDM, 1530 nm Ext Temp	10-2464-01	ITU-T G.694.2	0 to +85
ONS-SE-2G-1550=	SFP – OC-48/STM-16/GE, CWDM, 1550 nm Ext Temp	10-2465-01	ITU-T G.694.2	0 to +85
ONS-SE-2G-1570=	SFP – OC-48/STM-16/GE, CWDM, 1570 nm Ext Temp	10-2466-01	ITU-T G.694.2	0 to +85
ONS-SE-2G-1590=	SFP – OC-48/STM-16/GE, CWDM, 1590 nm Ext Temp	10-2467-01	ITU-T G.694.2	0 to +85
ONS-SE-2G-1610=	SFP – OC-48/STM-16/GE, CWDM, 1610 nm Ext Temp	10-2468-01	ITU-T G.694.2	0 to +85

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GBIC List and Descriptions

Grey GBICs

Cisco offers a range of Gray GBICs. Table 8 provides the details

Table 8. Gray GBICs

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
ONS-GC-GE-LX=	1000BASE-LX, SC, SM or MM	10-2191-01	1000BASE-SX IEEE-802.3	0 to +70
ONS-GC-GE-SX=	1000BASE-SX, SC, MM	10-2192-01	1000BASE-LX IEEE-802.3	0 to +70
ONS-GC-GE-ZX=	1000BASE-ZX, SM	10-2190-01	1000BASE-ZX IEEE-802.3	0 to +70
ONS-GX-2FC-MMI=	1 Gbps or 2 Gbps, 850 nm, SC, MM	10-2015-01	100-M5-SN-I, 100-M6-SN-I, 200-M5-SN-I, 200-M6-SN-I	–10 to +85
ONS-GX-2FC-SML=	1 Gbps or 2 Gbps, 1310 nm, SC, SM	10-2016-01	100-SM-LC-L 200-SM-LC-L	–10 to +85

CWDM GBICs

Cisco offers a range of CWDM GBICs. Table 9 lists details.

Table 9. CWDM GBICs

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
15454-GBIC-1470= EOS	1000BASE-CWDM 1470 nm GBIC (single mode only)	10-1453-01	ITU-T G.694.2	0 to +70
15454-GBIC-1490= EOS	1000BASE-CWDM 1490 nm GBIC (single mode only)	10-1454-01	ITU-T G.694.2	0 to +70
15454-GBIC-1510= EOS	1000BASE-CWDM 1510 nm GBIC (single mode only)	10-1455-01	ITU-T G.694.2	0 to +70
15454-GBIC-1530= EOS	1000BASE-CWDM 1530 nm GBIC (single mode only)	10-1456-01	ITU-T G.694.2	0 to +70
15454-GBIC-1550= EOS	1000BASE-CWDM 1550 nm GBIC (single mode only)	10-1457-01	ITU-T G.694.2	0 to +70
15454-GBIC-1570= EOS	1000BASE-CWDM 1570 nm GBIC (single mode only)	10-1458-01	ITU-T G.694.2	0 to +70
15454-GBIC-1590= EOS	1000BASE-CWDM 1590 nm GBIC (single mode only)	10-1459-01	ITU-T G.694.2	0 to +70
15454-GBIC-1610= EOS	1000BASE-CWDM 1610 nm GBIC (single mode only)	10-1460-01	ITU-T G.694.2	0 to +70

DWDM GBICs

Cisco offers a wide range of DWDM GBICs. Table 10 lists the details.

Table 10. DWDM GBICs

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
15454-GBIC-30.3= EOS	1000BASE-DWDM 1530.33 nm GBIC	10-1845-01	ITU G694, GR2918	0 to +70
15454-GBIC-31.1= EOS	1000BASE-DWDM 1531.12 nm GBIC	10-1846-01	ITU G694, GR2918	0 to +70
15454-GBIC-31.9= EOS	1000BASE-DWDM 1531.90 nm GBIC	10-1847-01	ITU G694, GR2918	0 to +70

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Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
15454-GBIC-32.6= EOS	1000BASE-DWDM 1532.68 nm GBIC	10-1848-01	ITU G694, GR2918	0 to +70
15454-GBIC-34.2= EOS	1000BASE-DWDM 1534.25 nm GBIC	10-1849-01	ITU G694, GR2918	0 to +70
15454-GBIC-35.0= EOS	1000BASE-DWDM 1535.04 nm GBIC	10-1850-01	ITU G694, GR2918	0 to +70
15454-GBIC-35.8= EOS	1000BASE-DWDM 1535.82 nm GBIC	10-1851-01	ITU G694, GR2918	0 to +70
15454-GBIC-36.6= EOS	1000BASE-DWDM 1536.61 nm GBIC	10-1852-01	ITU G694, GR2918	0 to +70
15454-GBIC-38.1= EOS	1000BASE-DWDM 1538.19 nm GBIC	10-1853-01	ITU G694, GR2918	0 to +70
15454-GBIC-38.9= EOS	1000BASE-DWDM 1538.98 nm GBIC	10-1854-01	ITU G694, GR2918	0 to +70
15454-GBIC-39.7= EOS	1000BASE-DWDM 1539.77 nm GBIC	10-1855-01	ITU G694, GR2918	0 to +70
15454-GBIC-40.5= EOS	1000BASE-DWDM 1540.56 nm GBIC	10-1856-01	ITU G694, GR2918	0 to +70
15454-GBIC-42.1= EOS	1000BASE-DWDM 1542.14 nm GBIC	10-1857-01	ITU G694, GR2918	0 to +70
15454-GBIC-42.9= EOS	1000BASE-DWDM 1542.94 nm GBIC	10-1858-01	ITU G694, GR2918	0 to +70
15454-GBIC-43.7= EOS	1000BASE-DWDM 1543.73 nm GBIC	10-1859-01	ITU G694, GR2918	0 to +70
15454-GBIC-44.5= EOS	1000BASE-DWDM 1544.53 nm GBIC	10-1860-01	ITU G694, GR2918	0 to +70
15454-GBIC-46.1= EOS	1000BASE-DWDM 1546.12 nm GBIC	10-1861-01	ITU G694, GR2918	0 to +70
15454-GBIC-46.9= EOS	1000BASE-DWDM 1546.92 nm GBIC	10-1862-01	ITU G694, GR2918	0 to +70
15454-GBIC-47.7= EOS	1000BASE-DWDM 1547.72 nm GBIC	10-1863-01	ITU G694, GR2918	0 to +70
15454-GBIC-48.5= EOS	1000BASE-DWDM 1548.51 nm GBIC	10-1864-01	ITU G694, GR2918	0 to +70
15454-GBIC-50.1= EOS	1000BASE-DWDM 1550.12 nm GBIC	10-1865-01	ITU G694, GR2918	0 to +70
15454-GBIC-50.9= EOS	1000BASE-DWDM 1550.92 nm GBIC	10-1866-01	ITU G694, GR2918	0 to +70
15454-GBIC-51.7= EOS	1000BASE-DWDM 1551.72 nm GBIC	10-1867-01	ITU G694, GR2918	0 to +70
15454-GBIC-52.5= EOS	1000BASE-DWDM 1552.52 nm GBIC	10-1868-01	ITU G694, GR2918	0 to +70
15454-GBIC-54.1= EOS	1000BASE-DWDM 1554.13 nm GBIC	10-1869-01	ITU G694, GR2918	0 to +70
15454-GBIC-54.9= EOS	1000BASE-DWDM 1554.94 nm GBIC	10-1870-01	ITU G694, GR2918	0 to +70
15454-GBIC-55.7= EOS	1000BASE-DWDM 1555.75 nm GBIC	10-1871-01	ITU G694, GR2918	0 to +70
15454-GBIC-56.5= EOS	1000BASE-DWDM 1556.55 nm GBIC	10-1872-01	ITU G694, GR2918	0 to +70
15454-GBIC-58.1= EOS	1000BASE-DWDM 1558.17 nm GBIC	10-1873-01	ITU G694, GR2918	0 to +70
15454-GBIC-58.9= EOS	1000BASE-DWDM 1558.98 nm GBIC	10-1874-01	ITU G694, GR2918	0 to +70
15454-GBIC-59.7= EOS	1000BASE-DWDM 1559.79 nm GBIC	10-1875-01	ITU G694, GR2918	0 to +70
15454-GBIC-60.6=	1000BASE-DWDM 1560.61 nm GBIC	10-1876-01	ITU G694, GR2918	0 to +70

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Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
EOS				

XFP List and Description

Grey XFP Modules

Cisco offers a range of Gray XFP modules. Table 11 lists the details.

Table 11. GRAY XFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
ONS-XC-10G-S1=	XFP – OC-192/STM-64/10GE – 1310 SR – SM LC	10-2012-03	ITU G694 I-64.1 GR253 SR-1 10GE BASE LR 1200-SM-LL-L IB-1x-DDR-LX	0 to +70
ONS-XC-10G-I2=	XFP – OC-192/STM-64/10GE – 1550 IR2 – SM LC	10-2193-02	ITU G694 S-64.2b GR253 IR-2 10GE BASE-ER	0 to +70
ONS-XC-10G-L2=	XFP – OC-192/STM-64 – 1550 LR2 – SM LC	10-2194-02	ITU G959.1 P1L1-2D2 GR253 LR-2 10GE BASE-ZR	0 to +70
ONS-XC-10G-SR-MM=	XFP – Ultra Short Reach MM –10GE BASE SR	10-2420-01	1200-MX-SN-I / 10GE BASE-SR	0 to +70
ONS-XC-8G-FC-SM=	8G FC XFP SM	10-2484-01	FC-PI-4 800-SN-LC-L	0 to +70
ONS-XC-8G-FC-MM=	8G FC XFP MM	10-2623-01	800-M5-SN-I 800-M6-SN-I	0 to +70

DWDM XFP Modules

Cisco offers a wide range of DWDM XFP modules. Table 12 lists the details.

Table 12. DWDM XFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
ONS-XC-10G-C=	10G Multirate Full C Band Tunable DWDM XFP, 50 GHz, LC	10-2480-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-30.3=	OC-192/STM-64/10GE, XFP, 1530.33, 100 GHz, LC	10-2347-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-31.1=	OC-192/STM-64/10GE, XFP, 1531.12, 100 GHz, LC	10-2346-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-31.9=	OC-192/STM-64/10GE, XFP, 1531.90, 100 GHz, LC	10-2344-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-32.6=	OC-192/STM-64/10GE, XFP, 1532.68, 100 GHz, LC	10-2345-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-33.4=	OC-192/STM-64/10GE, XFP, 1533.47, 100 GHz, LC	10-2343-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-34.2=	OC-192/STM-64/10GE, XFP, 1534.25, 100 GHz, LC	10-2342-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-35.0=	OC-192/STM-64/10GE, XFP, 1535.04, 100 GHz, LC	10-2341-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-35.8=	OC-192/STM-64/10GE, XFP, 1535.82, 100 GHz, LC	10-2340-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-36.6=	OC-192/STM-64/10GE, XFP, 1530.33, 100 GHz, LC	10-2347-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-37.4=	OC-192/STM-64/10GE, XFP, 1531.12, 100 GHz, LC	10-2346-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-38.1=	OC-192/STM-64/10GE, XFP, 1531.90, 100 GHz, LC	10-2344-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-38.9=	OC-192/STM-64/10GE, XFP, 1532.68, 100 GHz, LC	10-2345-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-39.7=	OC-192/STM-64/10GE, XFP, 1533.47, 100 GHz, LC	10-2343-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-40.5=	OC-192/STM-64/10GE, XFP, 1534.25, 100 GHz, LC	10-2342-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-41.3=	OC-192/STM-64/10GE, XFP, 1535.04, 100 GHz, LC	10-2341-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-42.1=	OC-192/STM-64/10GE, XFP, 1535.82, 100 GHz, LC	10-2340-02	ITU G694, GR2918	0 to +70

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Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
ONS-XC-10G-42.9=	OC-192/STM-64/10GE, XFP, 1536.61, 100 GHz, LC	10-2339-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-43.7=	OC-192/STM-64/10GE, XFP, 1537.40, 100 GHz, LC	10-2338-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-44.5=	OC-192/STM-64/10GE, XFP, 1538.19, 100 GHz, LC	10-2337-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-45.3=	OC-192/STM-64/10GE, XFP, 1538.98, 100 GHz, LC	10-2336-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-46.1=	OC-192/STM-64/10GE, XFP, 1539.77, 100 GHz, LC	10-2335-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-46.9=	OC-192/STM-64/10GE, XFP, 1540.56, 100 GHz, LC	10-2348-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-47.7=	OC-192/STM-64/10GE, XFP, 1541.35, 100 GHz, LC	10-2334-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-48.5=	OC-192/STM-64/10GE, XFP, 1542.14, 100 GHz, LC	10-2333-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-49.3=	OC-192/STM-64/10GE, XFP, 1542.94, 100 GHz, LC	10-2332-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-50.1=	OC-192/STM-64/10GE, XFP, 1543.73, 100 GHz, LC	10-2331-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-50.9=	OC-192/STM-64/10GE, XFP, 1544.53, 100 GHz, LC	10-2330-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-51.7=	OC-192/STM-64/10GE, XFP, 1545.32, 100 GHz, LC	10-2329-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-52.5=	OC-192/STM-64/10GE, XFP, 1546.12, 100 GHz, LC	10-2328-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-53.3=	OC-192/STM-64/10GE, XFP, 1546.92, 100 GHz, LC	10-2327-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-54.1=	OC-192/STM-64/10GE, XFP, 1547.72, 100 GHz, LC	10-2326-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-54.9=	OC-192/STM-64/10GE, XFP, 1548.51, 100 GHz, LC	10-2325-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-55.7=	OC-192/STM-64/10GE, XFP, 1549.32, 100 GHz, LC	10-2324-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-56.5=	OC-192/STM-64/10GE, XFP, 1550.12, 100 GHz, LC	10-2323-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-57.3=	OC-192/STM-64/10GE, XFP, 1550.92, 100 GHz, LC	10-2322-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-58.1=	OC-192/STM-64/10GE, XFP, 1551.72, 100 GHz, LC	10-2321-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-58.9=	OC-192/STM-64/10GE, XFP, 1552.52, 100 GHz, LC	10-2320-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-59.7=	OC-192/STM-64/10GE, XFP, 1553.33, 100 GHz, LC	10-2319-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-60.6=	OC-192/STM-64/10GE, XFP, 1554.13, 100 GHz, LC	10-2318-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-61.4=	OC-192/STM-64/10GE, XFP, 1554.94, 100 GHz, LC	10-2317-02	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP30.3=	10G MR, XFP,Edge Performance 1530.33, 100 GHz, LC	10-2577-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP31.1=	10G MR, XFP,Edge Performance 1531.12, 100 GHz, LC	10-2579-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP31.9=	10G MR, XFP,Edge Performance 1531.90, 100 GHz, LC	10-2580-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP32.6=	10G MR, XFP,Edge Performance 1532.68, 100 GHz, LC	10-2581-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP33.4=	10G MR, XFP,Edge Performance 1533.47, 100 GHz, LC	10-2582-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP34.2=	10G MR, XFP,Edge Performance 1534.25, 100 GHz, LC	10-2578-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP35.0=	10G MR, XFP,Edge Performance 1535.04, 100 GHz, LC	10-2611-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP35.8=	10G MR, XFP,Edge Performance 1535.82, 100 GHz, LC	10-2604-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP36.6=	10G MR, XFP,Edge Performance 1536.61, 100 GHz, LC	10-2615-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP37.4=	10G MR, XFP,Edge Performance 1537.40, 100 GHz, LC	10-2608-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP38.1=	10G MR, XFP,Edge Performance 1538.19, 100 GHz, LC	10-2610-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP38.9=	10G MR, XFP,Edge Performance 1538.98, 100 GHz, LC	10-2612-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP39.7=	10G MR, XFP,Edge Performance 1539.77, 100 GHz, LC	10-2609-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP40.5=	10G MR, XFP,Edge Performance 1540.56, 100 GHz, LC	10-2607-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP41.3=	10G MR, XFP,Edge Performance 1541.35, 100 GHz, LC	10-2606-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP42.1=	10G MR, XFP,Edge Performance 1542.14, 100 GHz, LC	10-2605-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP42.9=	10G MR, XFP,Edge Performance 1542.94, 100 GHz, LC	10-2603-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP43.7=	10G MR, XFP,Edge Performance 1543.73, 100 GHz, LC	10-2590-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP44.5=	10G MR, XFP,Edge Performance 1544.53, 100 GHz, LC	10-2602-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP45.3=	10G MR, XFP,Edge Performance 1545.32, 100 GHz, LC	10-2601-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP46.1=	10G MR, XFP,Edge Performance 1546.12, 100 GHz, LC	10-2589-01	ITU G694, GR2918	0 to +70

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Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
ONS-XC-10G-EP46.9=	10G MR, XFP,Edge Performance 1546.92, 100 GHz, LC	10-2588-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP47.7=	10G MR, XFP,Edge Performance 1547.72, 100 GHz, LC	10-2600-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP48.5=	10G MR, XFP,Edge Performance 1548.51, 100 GHz, LC	10-2599-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP49.3=	10G MR, XFP,Edge Performance 1549.32, 100 GHz, LC	10-2587-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP50.1=	10G MR, XFP,Edge Performance 1550.12, 100 GHz, LC	10-2598-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP50.9=	10G MR, XFP,Edge Performance 1550.92, 100 GHz, LC	10-2597-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP51.7=	10G MR, XFP,Edge Performance 1551.72, 100 GHz, LC	10-2596-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP52.5=	10G MR, XFP,Edge Performance 1552.52, 100 GHz, LC	10-2614-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP53.3=	10G MR, XFP,Edge Performance 1553.33, 100 GHz, LC	10-2595-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP54.1=	10G MR, XFP,Edge Performance 1554.13, 100 GHz, LC	10-2586-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP54.9=	10G MR, XFP,Edge Performance 1554.94, 100 GHz, LC	10-2585-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP55.7=	10G MR, XFP,Edge Performance 1555.75, 100 GHz, LC	10-2594-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP56.5=	10G MR, XFP,Edge Performance 1556.55, 100 GHz, LC	10-2613-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP57.3=	10G MR, XFP,Edge Performance 1557.36, 100 GHz, LC	10-2584-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP58.1=	10G MR, XFP,Edge Performance 1558.17, 100 GHz, LC	10-2583-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP58.9=	10G MR, XFP,Edge Performance 1558.98, 100 GHz, LC	10-2593-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP59.7=	10G MR, XFP,Edge Performance 1559.79, 100 GHz, LC	10-2576-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP60.6=	10G MR, XFP,Edge Performance 1560.61, 100 GHz, LC	10-2592-01	ITU G694, GR2918	0 to +70
ONS-XC-10G-EP61.4=	10G MR, XFP,Edge Performance 1561.43, 100 GHz, LC	10-2591-01	ITU G694, GR2918	0 to +70

CWDM XFP Modules

Cisco offers a wide range of CWDM XFP modules. Table 13 lists the details.

Table 13. CWDM XFP Modules

Product ID	Product Description	Part Number	Applicable Standard	Temperature Range (℃)
ONS-XC-10G-1470=	OC192/10GE/OTU2, CWDM, 1470mn, XFP C-Temp, 40km range	10-2548-01	ITU G694.2	0 to +70
ONS-XC-10G-1490=	OC192/10GE/OTU2, CWDM, 1490mn, XFP C-Temp, 40km range	10-2551-01	ITU G694.2	0 to +70
ONS-XC-10G-1510=	OC192/10GE/OTU2, CWDM, 1510mn, XFP C-Temp, 40km range	10-2552-01	ITU G694.2	0 to +70
ONS-XC-10G-1530=	OC192/10GE/OTU2, CWDM, 1530nm, XFP C-Temp, 40km range	10-2553-01	ITU G694.2	0 to +70
ONS-XC-10G-1550=	OC192/10GE/OTU2, CWDM, 1550nm, XFP C-Temp, 40km range	10-2554-01	ITU G694.2	0 to +70
ONS-XC-10G-1570=	OC192/10GE/OTU2, CWDM, 1570nm, XFP C-Temp, 40km range	10-2555-01	ITU G694.2	0 to +70
ONS-XC-10G-1590=	OC192/10GE/OTU2, CWDM, 1590nm, XFP C-Temp, 40km range	10-2556-01	ITU G694.2	0 to +70
ONS-XC-10G-1610=	OC192/10GE/OTU2, CWDM, 1610nm, XFP C-Temp, 40km range	10-2557-01	ITU G694.2	0 to +70

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SFP Technical Details

SONET/SDH SFP Modules

The Cisco SFP modules are compatible with SONET/SDH standards, and support the digital diagnostic functions specified in the SFF-8742 MSA. Table 14 lists the optical parameters for the Cisco ONS SONET/SDH SFP modules.

Table 14. SONET/SDH SFP Modules: Optical Specifications

Product ID	Operating Wavelength Range (nm)	Transmit Power Range (dBm)	Receiver Power Range (dBm)	Maximum Dispersion (ps/nm)
15454-SFP3-1-IR= ONS-SI-155-I1=	1261–1360	–15 to –8	–28 to –8	96 (at 155.52 Mbps)
ONS-SI-155-L1=	1263–1360	–5 to 0	–34 to –10	—
ONS-SI-155-L2=	1480–1580	–5 to 0	–34 to –10	—
ONS-SI-155-SR-MM=	1270–1380	–20 to –14	–30 to –14	—
ONS-SI-622-SR-MM=	1270–1380	–20 to –14 (50 µm) –24 to –14 (62.5 µm)	–26 to –14	—
15454-SFP12-4-IR= ONS-SI-622-I1=	1293–1334	–15 to –8	–28 to –8	46 (at 622.08 Mbps)
ONS-SI-622-L1=	1280–1335	–3 to +2	–28 to –8	—
ONS-SI-622-L2=	1480–1580	–3 to +2	–28 to –8	—
ONS-SE-2G-S1= ONS-SI-2G-S1=	1266–1360	–10 to -3	–18 to –3	12
ONS-SI-2G-I1= 15454-SFP-OC48-IR=	1260–1360	–5 to 0	–18 to 0	—
ONS-SI-2G-L1=	1280–1335	–2 to +3	–27 to –9	—
ONS-SE-2G-L2= ONS-SI-2G-L2=	1500–1580	–2 to +3	–28 to –9	1200–1600[1]

1. The indicated dispersion range corresponds to the approximate worst-case dispersion for 80 km G.652/G.654 fiber over the wavelength range 1500–1580 nm.

GBIC and Data SFP Modules

The GBIC and data SFP modules for the Cisco ONS Family are compatible with the IEEE 802.3, Single-Byte Command Code Sets CONnection architecture (SBCON) Rev. 2.3 [ESCON], ANSI INCITS 352-2002 Information technology – Fibre Channel – Physical Interfaces (FC-PI) Rev. 13 [1xFC and 2xFC], and support the digital diagnostic functions specified in the SFF-8742 MSA.

Table 15, 16, and 17 list the optical parameters for the GBIC and data SFP modules for the Cisco ONS Family.

Table 15. Ethernet Pluggable Modules: Optical Specifications

Product ID	Operating Wavelength Range (nm)	Transmit Power Range (dBm)	Receiver Power Range (dBm)	Maximum Dispersion (ps/nm)	Maximum Target Distance
ONS-SE-100-LX10=	1260–1360	–15 to –8	–28 to –8	—	10 km
ONS-SE-100-FX=	1270–1380	–20 to –14[1]	–31 to –14	—	
ONS-SE-100-BX10U=	1260–1360 (TX) 1480–1580 (RX)	–14 to –8	–28.2 to –7	—	10 km
ONS-SE-100-BX10D=	1480–1580 (TX) 1260–1360 (RX)	–14 to –8	–28.2 to –7	—	10 km
ONS-SE-GE-BXU=	1260–1360 (TX) 1480–1500 (RX)	–9 to –3	–19.5 to –3	—	10 km
ONS-SE-GE-BXD=	1480–1500 (TX) 1260–1360 (RX)	–9 to –3	–19.5 to –3	—	10 km

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Product ID	Operating Wavelength Range (nm)	Transmit Power Range (dBm)	Receiver Power Range (dBm)	Maximum Dispersion (ps/nm)	Maximum Target Distance
15327-SFP-LC-SX= 15454-SFP-LC-SX= ONS-SC-GE-SX= ONS-SI-GE-SX= 15454-SFP-GEFC-SX= ONS-SE-G2F-SX= ONS-GC-GE-SX=	770–860	–9.5 to 0	–17 to 0[2]	—	0.5 to 500 m (50/125 µm fiber) 0.5 to 300 m (62.5/125 µm fiber)
15327-SFP-LC-LX= 15454-SFP-LC-LX/LH= 15454-SFP-GE+-LX= ONS-SC-GE-LX= ONS-SI-GE-LX= ONS-SE-G2F-LX= ONS-GC-GE-LX=	1270–1355	–9.5 to –3	–19 to –3[3]	—	10 km
ONS-GC-GE-ZX= ONS-SI-GE-ZX= ONS-SE-GE-ZX=	1500–1580	0 to +5	–23 to –3	1200–1600[4]	80 km

1. 62.5/125 µm, NA = 0.275 fiber.
2. Minimum Stressed Sensitivity (10^{-12}): -12.5(62.5um) and -13.5(50um) dBm.
3. Minimum Stressed Sensitivity (10^{-12}): -14.4 dBm.
4. The indicated dispersion range corresponds to the approximate worst-case dispersion for 80 km G.652/G.654 fiber over the wavelength range 1500–1580 nm.

Table 16. ESCON SFP Module: Optical Specifications

Product ID	Operating Wavelength Range (nm)	Transmit Power Range (dBm)	Receiver Power Range (dBm)	Maximum Dispersion (ps/nm)	Maximum Target Distance
15454-SFP-200= ONS-SE-200-MM=	1280–1380	–20.5 to –15	–14 to –29[1]	–	2 km

1. Based on any valid 8B/10B code pattern measured at, or extrapolated to, 10E-15 BER measured at center of eye.

Table 17. Fibre Channel/FICON Pluggable Modules: Optical Specifications

Product ID	Operating Wavelength Range (nm)	Transmit Power Range (dBm)	Receiver Sensitivity (dBm)	Operating Distance (m)
1G FC/FICON (1062.5 Kbps)				
15454-SFP-GEFC-SX= ONS-SE-G2F-SX=	770–860	–10 to –3.5	–22	0.5 to 500 m (50/125 µm fiber) 0.5 to 300 m (62.5/125 µm fiber)
ONS-GX-2FC-MMI=	770–860	–10 to –2.5	–22	0.5 to 500 m (50/125 µm fiber) 0.5 to 300 m (62.5/125 µm fiber)
15454-SFP-GE+-LX= ONS-SE-G2F-LX=	1270–1360	–10 to –3.5	–22	2 to 10,000
ONS-GX-2FC-SML=	1270–1355	–9 to –3	–23.5	2 to 10,000
2G FC/FICON (2125 Kbps)				
15454-SFP-GEFC-SX= ONS-SE-G2F-SX=	830–860	–10 to –3.5	–20	0.5 to 300
ONS-GX-2FC-MMI=	820–860	–9.5 to –5	–15	0.5 to 300
15454-SFP-GE+-LX= ONS-SE-G2F-LX=	1270–1360	–10 to –3.5	–21	2 to 10,000
ONS-GX-2FC-SML=	1270–1355	–9 to –3	–23.5	2 to 10,000
4G FC/FICON (4250 Kbps)				
ONS-SE-4G-MM=	830–860	–9 to –3.5	–15	0 to 150 (50/125 µm fiber) 0 to 70 (62.5/125 µm fiber)
ONS-SE-4G-SM=	1270–1355	–8.4 to –3	29 µW OMA[1]	2 to 10,000

1. Specified OMA at 4.25 Gbps is equivalent to an average power of –17.3 dBm at an ER of 9 dB.

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Multirate SFP Module

Table 18 shows the optical parameters of the multirate SFP module.

Table 18. Multirate SFP Module: Optical Parameters

Product ID	Operating Wavelength Range (nm)	Optical Transmit Power (dBm)	Receive Sensitivity (dBm)
ONS-SE-Z1=	1270–1360 (Tx) 1270–1600 (Rx)	–5 to 0	–18 (OC-48/STM-16 –22 (GE) –23 (OC-12/STM-4) –23 (OC-3/STM-1)

Optical Service Channel SFP Module

Table 18 shows the optical parameters of the multirate Optical Service Channel SFP module.

Table 19. Multirate Optical Service Channel SFP Module: Optical Parameters

Product ID	Operating Wavelength Range (nm)	Optical Transmit Power (dBm)	Maximum Dispersion (ps/nm)	Receive Sensitivity (dBm)
ONS-SC-OSC-ULH=	1500–1520	1 to 5	4000	–43

CWDM and DWDM GBICs

The Cisco ONS 15454 GBICs support both CWDM and DWDM. Two models are available (Table 20 and Table 21).

Table 20. CWDM GBIC: Optical Specifications

Product ID	Transmit Power Range (dBm)	Receiver Wavelength Range (nm)	Receiver Power Range (dBm)	Dispersion Penalty (dB)
15454-GBIC-xxxx=[1]	+1 to +5	1450–1620	–29 to –7	2 (at 60 km) 3 (at 100 km)

1. Product ID xxxx ranges from 1470 to 1610.

Table 21. DWDM GBIC: Optical Specifications

Product ID	Receiver Wavelength Range (nm)	Transmitter Stability (pm)	Transmit Power Range (dBm)	Receiver Power Range (dBm)	Dispersion Penalty (dB)
15454-GBIC-xx.x=[1]	1450–1620	–100 to +100 (100GHz spacing)	–2 to +3	–28 to –7 (BER 10^{-12})	2 (at 60 km) 3 (at 100 km)

1. Product ID xx.x ranges from 30.3 to 60.6.

CWDM and DWDM SFP Modules

Cisco offers a set of CWDM SFP modules for 155 Mbps, 622 Mbps, and DWDM SFPs for 2.5-Gbps applications. Table 22 to Table 24 list the optical parameters.

Table 22. CWDM SFP Modules: Optical Specifications

Product ID	Receiver Wavelength Range (nm)	Spectral Width (nm)	Transmit Power Range (dBm)	Receiver Power Range (dBm)
ONS-SE-155-xxxx=[1]	1460–1620	1	0 to +5	–34 to –3 (BER 10^{-10})
ONS-SE-622-xxxx=	1460–1620	1	0 to +5	–28 to –3 (BER 10^{-10})
ONS-SC-Z3-xxxx=	1460–1620	1	0 to +4	–28 to –9 (BER 10^{-10})
ONS-SE-2G-xxxx=	1460-1620	1	-1 to +4	-28 to -9 (BER 10-12)

1. Product ID xxxx ranges from 1470 to 1610.

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Table 23. DWDM SFP Modules: Optical Specifications

Product ID	Receiver Wavelength Range (nm)	Transmitter Stability (pm)	Spectral Width (pm)	Transmit Power Range (dBm)
ONS-SC-2G-xx.x=[1]	1260–1620[2]	–100 to +100 (100 GHz spacing)	200	0 to +4
ONS-SC-4G-xx.x=	1260–1620	–100 to +100 (100 GHz spacing)	200	+3 to +7

1. Product ID xx.x ranges from 30.3 to 60.6.
2. Receiver sensitivity specified over 1528–1561 nm only, with 2 dB degradation permitted outside of this range.

Table 24. DWDM SFP Modules: Optical Performance

Optical Performance					
Power-Limited Performances					
		2G DWDM SFP		**4G DWDM SFP**	
Input power range	dBm	–9 to –28	At BER=10e-12 with SONET framed PRBS23 at OSNR of 21dB, 0.1nm BW	–9 to –22	At BER=10e-12 with SONET framed PRBS23 at OSNR of 26dB, 0.1nm RBW
Dispersion tolerance	ps/nm	–800 to +2400	Power Penalty=3dB, OSNR=21dB at 0.1nmBW (Noise Penalty=0dB)	–800 to +1600	–9 to –20 dBm with OSNR=26dB at 0.1nm RBW (Noise Penalty=0dB)
Noise-Limited Performances					
Input power range	dBm	–9 to –22	At BER=10e-12 with SONET framed PRBS23 at OSNR of 16dB at 0.1nm bandwidth	–9 to –18	At BER=10e-12 with SONET framed PRBS23 at OSNR of 22dB at 0.1nm bandwidth
Dispersion tolerance	ps/nm	–800 to +2400	Noise Penalty=3dB, OSNR=19dB at 0.1nmBW (Power Penalty=0dB)	–800 to +1600	–9 to –18 dBm with OSNR=25dB at 0.1nmBW (Power Penalty=0dB)

Grey XFP Modules

Cisco offers a set of Grey XFP modules for 10-Gbps applications. Table 25 lists the optical parameters.

Table 25. XFP Modules: Optical Specifications

Product ID	Transmitter Wavelength Range (nm)	Transmit Power Range (dBm)	Receiver Wavelength Range (nm)	CD Robustness (ps)	Receiver Power Range (dBm)
ONS-XC-10G-S1=	1260–1335	–6 to –1[1] –8.2 to +0.5[2]	1260–1565	6.6	–11 to –1[1] –14.4 to +0.5[2, 3]
ONS-XC-10G-I2=	1530–1565	–1 to +2	1260–1565	800	–14 to +2
ONS-XC-10G-L2=	1530–1565	0 to +4	1260–1565	1600	–24 to –7
ONS-XC-10G-SR-MM=	840–860	–7.3 to –1	840–860	–	–9.9 to –1
ONS-XC-8G-SM=	1260–1360	–8.4 to +0.5	1260–1360	–	–13.8 (–11.8 stressed) to +0.5 (targeting up to 10km distance)
ONS-XC-8G-MM=	840–860	–8.2 to –1.5	840–860	–	0.151 mW (stressed received in OMA)

1. SONET/SDH application
2. 10GE/10G Fibre Channel application
3. Stressed receiver sensitivity (maximum) in OMA is -10.3 dBm

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DWDM XFP Modules

Cisco offers a set of DWDM XFP modules for 10-Gbps applications. Table 26 lists the optical parameters.

Table 26. DWDM XFP Modules: Optical Specifications

Product ID	Receiver Wavelength Range (nm)	Transmitter Stability (pm)	Spectral Width (pm)	Transmit Power Range (dBm)
ONS-XC-10G-xx.x=[1]	1260–1607	–100 to +100 (100 GHz spacing)	200	–1 to +3
ONS-XC-10G-C=	1260–1607	–25 to +25 (50 GHz spacing)	200	0 to +3

1. Product ID xx.x ranges from 30.3 to 61.4.

Table 27. Fixed Wavelength DWDM XFP Modules: Optical Performance

Optical Performance			
Short Wavelength Performances			
Input power range	dBm	–7 to –20	At BER=10e-12 (at 1310 nm ± 20 nm) applicable at 9.9G, 10.3G only
Long Wavelength Performances C Band NO-FEC Applications Power-Limited			
Input power range	dBm	–7 to –23	At BER=10e-12 applicable at 9.9G, 10.3G only 23 dB OSNR (0.5 nm RBW)
Input power range	dBm	–7 to –20	At BER=10e-12 (–500 to +1600 ps/nm) applicable at 9.9G, 10.3G only – 23 dB OSNR (0.5nm RBW)
Long Wavelength Performances C Band NO-FEC Applications Noise-Limited			
Input power range	dBm	–7 to –18	At BER=10e-12 applicable at 9.9G, 10.3G only 17dB OSNR (0.5 nm RBW)
Input power range	dBm	–7 to –18	At BER=10e-12 (–500 to +1600 ps/nm) applicable at 9.9G, 10.3G only – 20 dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band FEC Applications Noise-Limited			
Input power range	dBm	–7 to –18	At BER PREFEC <10e-5 applicable at 10.7G, 11.1G only – 11 dB OSNR (0.5 nm RBW)
Input power range	dBm	–7 to –18	At BER PREFEC <10e-5 (-500 to +1100 ps/nm) applicable at 10.7G, 11.1G only – 12dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band E-FEC Applications Power-Limited			
Input power range	dBm	–7 to –27	At BER PREFEC <7*10e-4 applicable at 10.7G, 11.1G only – 23dB OSNR
Input power range	dBm	–7 to –24	At BER PREFEC <7*10e-4 (–500 to +1300 ps/nm) applicable at 10.7G, 11.1G only – 23 dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band E-FEC Applications Noise-Limited			
Input power range	dBm	–7 to –18	At BER PREFEC <7*10e-4 applicable at 10.7G, 11.1G only – 8 dB OSNR (0.5 nm RBW)
Input power range	dBm	–7 to –18	At BER PREFEC <7*10e-4 (–500 to +1100 ps/nm) applicable at 10.7G, 11.1G only – 9 dB OSNR (0.5 nm RBW)

Table 28. Edge Performance Fixed Wavelength DWDM XFP Modules: Optical Performance

Optical Performance			
Short Wavelength Performances			
Input power range	dBm	–7 to –20	At BER=10e-12 (at 1310 nm ± 20 nm) applicable at 9.9G, 10.3G only
Long Wavelength Performances C Band NO-FEC Applications Power-Limited			
Input power range	dBm	–7 to –23	At BER=10e-12 applicable at 9.9G, 10.3G only 23 dB OSNR (0.5 nm RBW)
Input power range	dBm	–7 to –20	At BER=10e-12 (–500 to +1100 ps/nm) applicable at 9.9G, 10.3G only – 23 dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band NO-FEC Applications Noise-Limited			
Input power range	dBm	–7 to –18	At BER=10e-12 applicable at 9.9G, 10.3G only 17 dB OSNR (0.5 nm RBW)
Input power range	dBm	–7 to –18	At BER=10e-12 (–500 to +1100 ps/nm) applicable at 9.9G, 10.3G only – 20 dB OSNR (0.5 nm RBW)

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Optical Performance			
Long Wavelength Performances C Band FEC Applications Noise-Limited			
Input power range	dBm	–7 to –18	At BER PREFEC <10e-5 applicable at 10.7G, 11.1G only – 11 dB OSNR (0.5 nm RBW)
Input power range	dBm	–7 to –18	At BER PREFEC <10e-5 (-500 to +1100 ps/nm) applicable at 10.7G, 11.1G only – 12 dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band E-FEC Applications Power-Limited			
Input power range	dBm	–7 to –27	At BER PREFEC <7*10e-4 applicable at 10.7G, 11.1G only – 23 dB OSNR
Input power range	dBm	–7 to –24	At BER PREFEC <7*10e-4 (–500 to +1100 ps/nm) applicable at 10.7G, 11.1G only – 23 dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band E-FEC Applications Noise-Limited			
Input power range	dBm	–7 to –18	At BER PREFEC <7*10e-4 applicable at 10.7G, 11.1G only – 8 dB OSNR (0.5 nm RBW)
Input power range	dBm	–7 to –18	At BER PREFEC <7*10e-4 (–500 to +1100 ps/nm) applicable at 10.7G, 11.1G only – 9 dB OSNR (0.5 nm RBW)

Table 29. Full C Band Tuneable Wavelength DWDM XFP Modules: Optical Performance

Optical Performance			
Short Wavelength Performances			
Input power range	dBm	–7 to –20	At BER=10e-12 (at 1310 nm ± 20nm) applicable at 9.9G, 10.3G only
Long Wavelength Performances C Band NO-FEC Applications Power-Limited			
Input power range	dBm	–7 to –24	At BER=10e-12 applicable at 9.9G, 10.3G only 23dB OSNR (0.5nm RBW)
Input power range	dBm	–7 to –22	At BER=10e-12 (–500 to +1600 ps/nm) applicable at 9.9G, 10.3G only – 23 dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band NO-FEC Applications Noise-Limited			
Input power range	dBm	–7 to –22	At BER=10e-12 applicable at 9.9G, 10.3G and 10.5 only 19dB OSNR (0.5 nm RBW)
Input power range	dBm	–7 to –20	At BER=10e-12 (–500 to +1600 ps/nm) applicable at 9.9G, 10.3G and 10.5G only – 19 dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band FEC Applications Noise-Limited			
Input power range	dBm	–7 to –18	At BER PREFEC <10e-5 applicable at 10.7G, 11.1G only – 8.5 dB OSNR (0.5 nm RBW)
Input power range	dBm	–7 to –18	At BER PREFEC <10e-5 (–400 to +1000 ps/nm) applicable at 10.7G, 11.1G only – 10 dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band E-FEC Applications Power-Limited			
Input power range	dBm	–7 to –27	At BER PREFEC <7*10e-4 applicable at 10.7G, 11.1G only – 19 dB OSNR
Input power range	dBm	–7 to –26	At BER PREFEC <7*10e-4 (–400 to +1300 ps/nm) applicable at 10.7G, 11.1G and 11.3G only – 19 dB OSNR (0.5 nm RBW)
Long Wavelength Performances C Band E-FEC Applications Noise-Limited			
Input power range	dBm	–7 to –20	At BER PREFEC <7*10e-4 applicable at 10.7G, 11.1G only – 5 dB OSNR (0.5 nm RBW)
Input power range	dBm	–7 to –20	At BER PREFEC <7*10e-4 (–400 ps/nm) applicable at 10.7G, 11.1G and 11.3G only – 7.5 dB OSNR (0.5 nm RBW)
Input power range	dBm	–7 to –20	At BER PREFEC <7*10e-4 +1300 ps/nm) applicable at 10.7G, 11.1G and 11.3G only – 7 dB OSNR (0.5 nm RBW)

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DWDM XFP Module

Cisco offers an CWDM XFP module for 10-Gbps applications. Table 30 lists the optical parameters.

Table 30. CWDM XFP Modules: Optical Specifications

Product ID	Wavelength Range Rx (nm)	Sensitivity Rx (dBm)	Stability Tx (nm)	Dispersion Tolerance (ps/nm)	Tx Power Range (dBm)	Supported Bit Rate	Target Distance
ONS-XC-10G-xxxx=[1]	1450-1620	–14	+/– 6.5	0 to +800	+3 to +7	10GE OTU2 OTU2e (up to 11.1Gbps) 10G FC	40 km (OTU2 and 10GE)

1. Product ID xxxx ranges from 1470 to 1610.

Electrical SFP Modules

Cisco offers multiple options for copper SFP modules. Table 31 lists the main characteristics.

Table 31. Electrical SFP Module Specifications

Product ID	Bit Rate	Connector	Typical Distance
ONS-SE-ZE-EL=	10/100/1000 Mbps	RJ-45	100 m
ONS-SC-155-EL=	155 Mbps	Standard Coaxial Connector 75Ω	100m
ONS-SC-E1-T1-PW=	34.368 Mbps and 44.736 Mbps	RJ-48	See note
ONS-SC-E1-T1-PW=	1.544 and 2.048 Mbps	RJ-48 (100Ω for T1 and 120Ω for E1)	See note
ONS-SC-EoP1=	1.544 and 2.048 Mbps	RJ-48 (100Ω for T1 and 120Ω for E1)	See note
ONS-SC-EOP3=	34.368 and 44.736 Mbps	RJ-48	See note

Cables and Distances

Table 32. PDHoEthernet SFPs

Product ID	Line Impedance	Cable Type	Cable Length	Short Haul	Long Haul	Connector
ONS-SC-E1-T1-PW= for E1	120Ω, balanced	UTP CAT-5	max, 22 AWG wire	770m (2530 ft)	2664m (8740 ft)	RJ-48
ONS-SC-E1-T1-PW= for T1	100Ω, balanced	UTP CAT-5	max, 22 AWG	1192m (3910 ft)	2874m (9430 ft)	RJ-48
ONS-SC-EoP1= for E1	100Ω, balanced		max, up to 1829m (6000 ft) for AWG 22 cable			
ONS-SC-EoP1= for T1	120Ω, balanced		max, up to 2500m (8202 ft) for AWG 22 cable			
ONS-SC-E3-T3-PW= and ONS-SC-EoP3= for E3	75Ω, unbalanced		max, up to 275m (900 ft)			hDIN 1.0/2.3 connector
ONS-SC-E3-T3-PW= and ONS-SC-EoP3= for T3	75Ω, unbalanced		max, up to 275m (900 ft)			DIN 1.0/2.3 connector

Table 33. E1/T1 Connector Pin Out

Pin	Function
1	Tx Ring
2	Tx Tip
3, 6, 7, 8	–
4	Rx Ring
5	Rx Tip
S = Conn. Body	FGND/GND

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Compatibility Matrix

Tables 34 through 39 indicate which SFP modules are available on different Cisco ONS Family platforms and boards.

Table 34. Cisco ONS 15454 MSPP

	Cisco ONS 15454 MSPP Boards												
Product ID	E1000-2-G	FC_MR-4	G1K-4	CE1000-4	ML1000-2	ML100-X-8	10G-SR1	10G-XR	MRC-12	MRC-4	MRC-12-2.5G	ML-MR-10	CE-MR-10
ONS-GC-GE-LX=	4.x		4.x	7.0									
ONS-GC-GE-SX=	4.x		4.x	7.0									
ONS-GC-GE-ZX=			4.x	7.0									
15454-GBIC-xx.x=[1]			4.x										
15454-GBIC-xxxx=[2]			4.x										
ONS-GX-2FC-MMI=		5.0											
ONS-GX-2FC-SML=		5.0											
ONS-SE-100-LX10=						6.0							
ONS-SI-100-LX10=						9.0						8.5	8.5
ONS-SE-100-FX=						6.0							
ONS-SI-100-FX=						9.0						8.5	8.5
ONS-SE-100-BX10D=						9.0						8.5	8.5
ONS-SE-100-BX10U=						9.0						8.5	8.5
15454-SFP-LC-SX=					4.x								
15454-SFP-LC-LX/LH=					4.x								
ONS-SC-GE-SX=					4.x								
ONS-SI-GE-SX=					9.0							8.5	8.5
ONS-SC-GE-LX=					4.x								
ONS-SI-GE-LX=					9.0							8.5	8.5
ONS-SI-GE-ZX=					9.0							8.5	8.5
ONS-SE-ZE-EL=												8.5	8.5
ONS-SI-155-SR-MM=									8.0	8.0	8.0		
ONS-SI-155-I1=									6.0	8.0	8.0		
ONS-SI-155-L1=									6.0	8.0	8.0		
ONS-SI-155-L2=									6.0	8.0	8.0		
ONS-SE-ZE-EL=												8.5	8.5
ONS-SC-155-EL=[3]									8.5		8.5		
ONS-SI-622-SR-MM=									8.0	8.0	8.0		
ONS-SI-622-I1=									6.0	8.0	8.0		
ONS-SI-622-L1=									6.0	8.0	8.0		
ONS-SI-622-L2=									6.0	8.0	8.0		
ONS-SI-2G-S1									6.0	8.0	8.0		
ONS-SI-2G-I1=									6.0	8.0	8.0		
ONS-SI-2G-L1=									6.0	8.0	8.0		
ONS-SI-2G-L2=									6.0	8.0	8.0		
ONS-SE-Z1=									8.0	8.0	8.0		

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Product ID	Cisco ONS 15454 MSPP Boards												
	E1000-2-G	FC_MR-4	G1K-4	CE1000-4	ML1000-2	ML100-X-8	10G-SR1	10G-XR	MRC-12	MRC-4	MRC-12-2.5G	ML-MR-10	CE-MR-10
ONS-SE-155-xxxx[4]									6.0	8.0	8.0		
ONS-SE-622-xxxx[5]									6.0	8.0	8.0		
ONS-SC-2G-xx.x=[6]									6.0	8.0	8.0	9.0[9]	9.0[9]
ONS-SC-Z3-xxxx=[7]									8.0	8.0	8.0	9.0[9]	9.0[9]
ONS-XC-10G-S1=							6.0	6.0					
ONS-XC-10G-I2=								6.0					
ONS-XC-10G-L2=								6.0					
ONS-XC-10G-xx.x=[8]								8.5					
ONS-XC-10G-EPxx.x=[8]								9.2.1					
ONS-XC-10G-C=								9.1					

1. For DWDM GBIC, xx.x ranges from 30.3 to 60.6.
2. For CWDM GBIC, xxxx ranges from 1470 to 1610.
3. Valid only for the ETSI/SDH platform.
4. For CWDM 155-Mbps SFP modules, xxxx ranges from 1470 to 1610.
5. For CWDM 622-Mbps SFP modules, xxxx ranges from 1470 to 1610.
6. For DWDM SFP modules, xx.x ranges from 30.3 to 60.6; wavelength 28.7, 33.4, 41.3, 49.3, 57.3 requires Release 8.5.
7. For CWDM SFP modules, xxxx ranges from 1470 to 1610.
8. For DWDM XFP modules, xx.x ranges from 30.3 to 61.4.
9. A maximum of four DWDM or CWDM SFPs can be placed in the ML-MR and CE-MR cards. No other SFPs can be placed in the board. The maximum ambient temperature suitable for this configuration is +45°C.

Table 35. Cisco ONS 15454 MSTP

Product ID	Cisco ONS 15454 MSTP Boards												
	100M-2.5G MR-TXP	2.5G MR DataMux	4x2,5G FEC MXP	4x2.5G EFEC MXP and MLSE MXP	10G EFEC TXP 10G MLSE TXP	10G MR DME and MLSE DME	ADM-10G	GE-XP	GE-XPE	10GE-XP(E)	OTU2-XP	40G-MXP/40E-MXP,40ME-MXP	TNC
15454-SFP3-1-IR=	4.5												
ONS-SC-155-EL=							9.0						
ONS-SI-155-SR-MM=	8.0												
ONS-SI-155-I1=	9.0												
ONS-SI-155-L2=							8.0						
15454-SFP12-4-IR=	4.5												
ONS-SI-622-I1=	9.0						8.0						
15454-SFP-OC48-IR=	4.5		4.6	4.7									
ONS-SE-2G-S1=	5.0		5.0	5.0									
ONS-SE-2G-L2=	5.0			5.0									
ONS-SI-2G-S1	9.0			9.0			8.0						
ONS-SI-2G-I1=	9.0			9.0			8.0						
ONS-SI-2G-L1=				9.2									
ONS-SI-2G-L2=	9.0			9.0			8.0						
ONS-SE-Z1=	9.1						8.0						
ONS-SE-ZE-EL=						8.0		8.0	9.0				

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Product ID	Cisco ONS 15454 MSTP Boards												
	100M-2.5G MR-TXP	2.5G MR DataMux	4x2,5G FEC MXP	4x2.5G EFEC MXP and MLSE MXP	10G EFEC TXP 10G MLSE TXP	10G MR DME and MLSE DME	ADM-10G	GE-XP	GE-XPE	10GE-XP(E)	OTU2-XP	40G-MXP/40E-MXP,40ME-MXP	TNC
15454-SFP-GE+-LX=	4.5	5.0				7.0							
15454-SFP-GEFC-SX=	4.5	5.0				7.0							
ONS-SE-G2F-SX=	5.0	5.0				7.0	8.0	8.0	9.0				
ONS-SE-G2F-LX=	5.0	5.0				7.0	8.0	8.0	9.0				
ONS-SE-GE-ZX=	7.0	7.0											
ONS-SI-GE-ZX=						8.5[1]	8.0	8.0	9.0				
ONS-SE-GE-BXU=								9.1	9.1				
ONS-SE-GE-BXD=								9.1	9.1				
ONS-SI-100-LX10=									9.1				
ONS-SI-100-FX=									9.1				
ONS-SC-E3-T3-PW=									9.2[14]				
ONS-SC-E1-T1-PW=									9.2[14]				
ONS-SC-EoP1=									9.2[14]				
ONS-SC-EOP3=									9.2[14]				
15454-SFP-200=	4.5												
ONS-SE-200-MM=	7.0	7.0											
ONS-SE-4G-MM=						7.0							
ONS-SE-4G-SM=						7.0							
ONS-SC-OSC-ULH=													9.2
ONS-SE-155-xxxx=													9.2
ONS-SC-2G-xx.x=[3]	8.5			8.5			8.5	8.5	9.0				
ONS-SC-Z3-xxxx=[4]	8.5	8.5		8.5			8.5	8.5	9.0				9.2[13]
ONS-XC-10G-S1=[9]					5.0[5]		8.0	8.0	9.0	8.0	9.0	9.2	
ONS-XC-10G-I2=[6]					8.5		9.1[12]	8.5	9.0	8.5	9.0	9.2	
ONS-XC-10G-L2=[2]					7.0[8]				9.1	9.1	9.0	9.2	
ONS-XC-10G-xx.x=[7]							8.0	8.0	9.0	8.0	9.0[10]		
ONS-XC-10G-SR-MM=					9.0		9.0	9.0	9.0	9.0	9.0	9.2	
ONS-XC-8G-SM=												9.2	
ONS-XC-8G-MM=												9.3	
ONS-XC-10G-xxxx=							9.2	9.2	9.2	9.2		9.2	
ONS-XC-10G-EPxx.x=[7]							9.2.1	9.2.1	9.2.1	9.2.1	9.2.1	9.2.1	
ONS-XC-10G-C=							9.1	9.1	9.1	9.1	9.1	9.2	

1. Supported in software Release 7.0 but not in 8.0. Supported in Release 8.5.

2. ONS-XC-10G-L2. 10G TXP, when equipped with LR2 XFP, needs to be placed on high-speed slot for power dissipation constraint if using FTA-3 or FTA-48V. If CC-FTA is used, there is no restriction.

3. For DWDM SFP modules, xx.x ranges from 30.3 to 60.6. For DWDM SFP modules, xx.x ranges from 30.3 to 60.6, wavelength 28.7, 33.4, 41.3, 49.3, 57.3 requires Release 8.5. Supports GE, 1G FC, 2G FC, and OC-48, pending board rate support. Only P/N version 02 is qualified on the Cisco ONS 15454 MSTP. DWDM SFP modules will require mandatory CC-FTA use.

4. For CWDM SFP modules, xxxx ranges from 1470 to 1610. Supports GE, 1G FC, 2G FC, and OC-48, pending board rate support. CWDM SFP modules will require mandatory CC-FTA use.

5. 5G IB are supported by ONS-XC-10G-S1= P/N version 03 only on 10E TXP MLSE version.

6. Only P/N version 02 is qualified on the Cisco ONS 15454 MSTP.

7. For DWDM XFP modules, xx.x ranges from 30.3 to 61.4.

8. 10GEBASE-ZR rate is supported starting by Release 8.5.2 .

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9. P/N 10-2012-02 supports: 10G-1200-SM-LL-L / 10GE BASE-LR / 10GE BASE-LW / OC192 SR1 / STM-64 I-64.1 / OTU-2 at 10.7G. P/N 10-2012-03 supports: 10G-1200-SM-LL-L / 10GE BASE-LR / 10GE BASE-WR / OC192 SR1 / STM-64 I.64 / OTU-2 at 10.7G, 11.05G and 11.09G.

10. P/N version 02 is required to support 10G FC with OTN wrapping at 11.3 Gbps.

12. Supported with limited temperature range up to 45℃ ambient temperature.

13. Supported only with 1510 nm wavelength.

14. Maximum of 10 per XPE line card

Table 36. Cisco ONS 15600 MSSP

Product ID	Cisco ONS 15600 MSSP Boards	
	ASAP 4PIO CARD	**ASAP 1PIO CARD**
ONS-SI-155-L2=	6.0	
ONS-SI-622-L2=	6.0	
ONS-SE-Z1=	6.0	
ONS-SI-2G-S1=	6.0	
ONS-SI-2G-I1=	9.0	
ONS-SE-2G-L2=	6.0	
ONS-SI-2G-L2=	9.0	
ONS-SC-2G-xx.x=[1]	6.0	
ONS-XC-10G-S1=		6.0
ONS-XC-10G-I2=		9.0
ONS-XC-10G-L2=		6.0
ONS-XC-10G-xx.x=		9.0

1 For DWDM SFP modules, xx.x ranges from 30.3 to 60.6.

Table 37. Cisco ONS 15300 Series Platforms

Product ID	Cisco ONS 15300 Series Boards				
	15305	**15310-CE-MR-6**	**15310-CL**	**15310-MA**	**15327**
15327-SFP-LC-SX=					X
15327-SFP-LC-LX=					X
ONS-SC-GE-SX=	X				X
ONS-SC-GE-LX=	X				X
15454-SFP-LC-SX=	X				
15454-SFP-LC-LX=	X				
ONS-SI-100-LX10=		8.5.1			
ONS-SI-100-FX=		8.5.1			
ONS-SE-100-BX10U=		8.5.1			
ONS-SE-100-BX10D=		8.5.1			
ONS-SI-GE-SX=		8.5.1			
ONS-SI-GE-LX=		8.5.1			
ONS-SI-GE-ZX=		8.5.1			
ONS-SE-ZE-EL=		8.5.1			
ONS-SC-155-EL=				9.0[4]	
ONS-SI-155-SR-MM=				9.1[4]	
ONS-SI-155-I1=			7.0	7.0	
ONS-SI-155-L1=			7.0	7.0	
ONS-SI-155-L2=			7.0	7.0	
ONS-SI-622-I1=			7.0	7.0	
ONS-SI-622-L1=			7.0	7.0	
ONS-SI-622-L2=			7.0	7.0	

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Product ID	Cisco ONS 15300 Series Boards				
	15305	15310-CE-MR-6	15310-CL	15310-MA	15327
ONS-SI-2G-S1=				7.0	
ONS-SI-2G-I1=				7.0	
ONS-SI-2G-L1=				7.0	
ONS-SI-2G-L2=				7.0	
ONS-SE-Z1=				8.5	
ONS-SE-155-xxxx[1]			9.0	7.0	
ONS-SE-622-xxxx[2]			9.0	7.0	
ONS-SE-2G-xxxx[2]				9.0[4]	
ONS-SC-2G-xx.x=[3]				7.0	

1. For CWDM 155 Mbps SFP modules, xxxx ranges from 1470 to 1610.
2. For CWDM SFP modules, xxxx ranges from 1470 to 1610.
3. For DWDM SFP modules, xx.x ranges from 30.3 to 60.6. For DWDM SFP modules, xx.x ranges from 30.3 to 60.6, wavelength 28.7, 33.4, 41.3, 49.3, 57.3 requires Release 8.5.
4. 9.0 for 15310-SDH version, 9.0 for 15310-SDH version, 9.1 for SONET version.

Table 38. Cisco ONS 15500 Series Platforms

Product ID	Cisco ONS 15530 Boards			Cisco ONS 15540 Boards
	8-Port FC/GE	4-Port FC/FICON	8-Port Multiservice	TSP2
15454-SFP-GEFC-SX= ONS-SE-G2F-SX=	X	X	X	X

Table 39. Cisco ONS 4G Fibre Channel DWDM SFP and MDS Line Card

Cisco MDS Line Cards	Product ID ONW-SC-4G-xx.x=
DS-X9112	X
DS-X9124	X
DS-X9148	X
DS-X9224-96K9	X
DS-X9248-96K9	X
DS-X9248-48K9	X
DS-X9304-18K8	X
DS-C9222I-K9	X
DS-C9124-K9	X

SFP Physical Details

Tables 40 through 46 list reliability data, power consumption, and cable type to be used for each pluggable module.

Table 40. SONET/SDH SFP Modules

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Average Latency	Supported Cable Connection
ONS-SE-2G-S1=	3,039,499	1W	900ps	LC-LC
ONS-SE-2G-L2=	5,346,554	1W	900ps	LC-LC
ONS-SI-155-SR-MM=	4,878,048	1W	900ps	LC-LC
ONS-SI-155-I1=	3,039,499	1W	900ps	LC-LC
ONS-SI-155-L1=	5,346,554	1W	900ps	LC-LC
ONS-SI-155-L2=	5,346,554	1W	900ps	LC-LC
ONS-SI-622-SR-MM=	4,761,904	1W	900ps	LC-LC

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Product ID	MTBF in Hours	Maximum Power Consumption (W)	Average Latency	Supported Cable Connection
ONS-SI-622-I1=	3,039,499	1W	900ps	LC-LC
ONS-SI-622-L1=	3,039,499	1W	900ps	LC-LC
ONS-SI-622-L2=	5,346,554	1W	900ps	LC-LC
ONS-SI-2G-S1	3,039,499	1W	900ps	LC-LC
ONS-SI-2G-I1=	9,970,080	1W	900ps	LC-LC
ONS-SI-2G-L1=	3,039,499	1W	900ps	LC-LC
ONS-SI-2G-L2=	5,346,554	1W	900ps	LC-LC

Table 41. OSC SFP Modules

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Average Latency	Supported Cable Connection
ONS-SC-OSC-ULH=	TBD	1W	900ps	LC-LC

Table 42. Data SFP Modules

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Average Latency	Supported Cable Connection
ONS-SI-100-BXD=	9,970,080	1W	900ps	LC-LC
ONS-SI-100-BXU=	9,970,080	1W	900ps	LC-LC
ONS-SE-100-LX10=	9,970,080	1W	900ps	LC-LC
ONS-SI-100-LX10=	9,970,080	1W	900ps	LC-LC
ONS-SE-100-FX=	9,970,080	1W	900ps	LC-LC
ONS-SI-100-FX=	9,970,080	1W	900ps	LC-LC
ONS-SE-GE-BXU=	6,250,000	1W	900ps	LC-LC
ONS-SE-GE-BXD=	6,250,000	1W	900ps	LC-LC
ONS-SC-GE-SX=	7,919,921	1W	900ps	LC-LC
ONS-SI-GE-SX=	7,919,921	1W	900ps	LC-LC
ONS-SC-GE-LX=	9,970,080	1W	900ps	LC-LC
ONS-SI-GE-LX=	9,970,080	1W	900ps	LC-LC
ONS-SE-G2F-SX=	7,919,921	1W	900ps	LC-LC
ONS-SE-G2F-LX=	9,970,080	1W	900ps	LC-LC
ONS-SE-200-MM=	9,970,080	1W	900ps	LC-LC
ONS-SE-4G-MM=	7,919,921	1W	900ps	LC-LC
ONS-SE-4G-SM=	3,039,499	1W	900ps	LC-LC

Table 43. Electrical SFP Modules

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Average Latency	Supported Cable Connection
ONS-SE-ZE-EL=	4,068,349	1	450ns	RJ-45 STP CAT5e and CAT6
ONS-SC-155-EL=	5,714,286	1	450ns	75Ω DIN 1.0/2.3
ONS-SC-E3-T3-PW=	TBD	1.25		RJ 45
ONS-SC-E1-T1-PW=	2,496,307	1.1		RJ 45
ONS-SC-EoP1=	5,269,564	1.25		RJ 45
ONS-SC-EOP3=	6,098,205	1.25		RJ 45

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Table 44. Multirate SFP Module

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Average Latency	Supported Cable Connection
ONS-SE-Z1=	3,039,499	1	900ps	

Table 45. Grey GBICs

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Supported Cable Connection
ONS-GC-GE-LX=	7,919,921	1.8	SC-PC SM
ONS-GC-GE-SX=	9,970,080	1.8	SC-PC MM
ONS-GC-GE-ZX=	5,346,554	1.8	SC-PC SM
ONS-GX-2FC-MMI=	7,919,921	1.8	SC-PC MM
ONS-GX-2FC-SML=	3,039,499	1.8	SC-PC SM

Table 46. Grey XFP Modules

Product ID	MTBF in Hours	Maximum Power Consumption (W)	Average Latency	Supported Cable Connection
ONS-XC-10G-S1=	3,039,506	2.5	5ns	LC-LC
ONS-XC-10G-I2=	3,279,693	3	5ns	LC-LC
ONS-XC-10G-L2=	2,711,429	3	5ns	LC-LC
ONS-XC-10G-SR-MM=	1,974,000	1.5	5ns	LC-LC
ONS-XC-8G-SM=	3,039,506	2.5	5ns	LC-LC
ONS-XC-8G-MM=		1.5	5ns	LC-LC

Table 47. xWDM SFP Modules

Product ID	MTBF	Maximum Power Consumption (W)	Supported Cable Connection
ONS-SC-2G-xx.x=	5,346,554	1	LC-LC
ONS-SC-4G-xx.x=	1,856,000	1.25	LC-LC
ONS-SC-Z3-xxxx=	2,070,393	1.1	LC-LC
ONS-SE-155-xxxx=	5,346,554	1	LC-LC
ONS-SE-622-xxxx=	5,346,554	1	LC-LC
ONS-XC-10G-xx.x=	2,711,000	3.5	LC-LC
ONS-XC-10G-EPxx.x=	2,711,000	3.5	LC-LC
ONS-XC-10G-C=	1,000,000	3.5	LC-LC
ONS-XC-10G-xxxx=	2,711,000	3.5	LC-LC

Ordering Information

You can order all the available pluggable interfaces from Cisco.com. Please check the Pricing Tool for further information: www.cisco.com/cgi-bin/front.x/pricing?Request=ShowCurrentPriceSrch. Select ONS Pluggable Optics Series as the Product Family.

Third-Party Equipment

The use of third-party equipment insteadof Cisco ONS SFP products is allowed but not recommended, for the following reasons.

- Cisco can guarantee service-level agreements (SLAs) only on parts that have undergone the Cisco test plan and validation process. Without comprehensive testing and validation, SFP products may display anomalous behavior that can affect host-board performance.
- Cisco SFP modules reserve specific EEPROM fields to store inventory data such as Product ID, Part Number, Serial Number, and CLEI CODE that are specific to Cisco SFP modules and are required for SLAs.

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Lead Time

Please check the Lead-Time Tool to identify standard lead time for Cisco ONS Family products: http://www.cisco.com/cgi-bin/front.x/leadtimes.cgi.

A different approach is used for DWDM SFP/XFP modules. Based upon customer usage, Cisco has identified and selected particular high-usage wavelengths, and will maintain shorter lead times for these products. Short lead-time DWDM SFP/XFP modules are from 1546.1 to 1560.6 with a 4 skip 1 approach.

Unforecasted pluggable optics on different lambdas could lead to 16 weeks of delivery time.

End-of-Sale and End-of-Life Products

Table 48 lists the Cisco SFP modules that have reached end-of-sale or end-of-life status, followed by their replacement products.

Table 48. End-of-Sale and End-of-Life SFP Modules

End-of-Life or End-of-Sale Product ID	Replacement Product ID
15327-SFP-LC-SX=	ONS-SC-GE-SX=
15327-SFP-LC-LX=	ONS-SC-GE-LX=
15454-SFP-LC-SX=	ONS-SC-GE-SX=
15454-SFP-LC-LX=	ONS-SC-GE-LX=
15454-SFP-GE+-LX=	ONS-SE-G2F-SX=
15454-SFP-GEFC-SX=	ONS-SE-G2F-SX=

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